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USSR USES ROCKETS FOR STRATOSPHERIC OBSERVATION

The USSR is using rockets propelled by liquid oxygen to study the stratosphere. The main part of the rocket's body is the container for fuel. On the tip of the rocket are the observation and recording instruments. These include a cosmic-ray counter, a specially constructed electric thermometer which is sensitive to minute temperature changes of the order of 0.0005 degree centigrade, a spectrograph which photographs the spectrum of the sun, and automatic cameras and radio sets.

In operation, the rocket works as follows: At first, the prepared rocket rests in the slideway of a metal tower. At a given signal, the rocket shoots up and is soon out of visual range. Only through a telescope or by radar can the path of the rocket be followed. The rocket is controlled gyroscopically and guided in the desired direction. If, at any time, the rocket goes off its path, a motor steers it back. Through the steady fuel consumption, the weight is decreased every minute. After a predetermined lapse of time, the instruments automatically begin to function. Tiny, transparent fluorite balls on the surface of the metal body collect sun rays and direct them into the spectrograph with the aid of a complicated system of mirrors. The instruments are so sensitive that all measurements are taken in the short time in which the rocket stays at this high altitude. Then a parachute opens and carefully carries the rocket back to earth.

What have these rocket trips accomplished? First of all, the range of observation within the stratosphere has been increased by about 400 kilometers. Of special interest are the photographs of the spectrum of the sun taken at a height of 90 kilometers, showing that the ultraviolet part of the spectrum is much greater at this height than it is at the earth's surface. The vapor layer over the earth hinders the penetration of ultraviolet rays, which are dangerous for many living things. Photos taken from a height of 100 kilometers distinctly show the earth's curvature. The rocket also took air samples at a height of 70 kilometers; the composition of this air will make many important conclusions possible. It can already be clearly recognized that many phenomena in our atmosphere originate at upper levels of the stratosphere.

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